Invertebrates

[1] With over 2 million known animal species on Earth, 98% of them are invertebrates. Invertebrates are animals that don't have backbones. They live in a variety of environments, from hot and unbearable deserts to frigid and equally unbearable polar regions. They also come in an assortment of shapes and colors. To better understand invertebrates, scientists group them into eight major categories. Here are the categories and a fact or two about each category:

[2] **Arthropods** are invertebrates with hard outer shells (exoskeletons), with jointed legs, and with segmented bodies. Since about 75% of all animal species are arthropods, they represent the largest invertebrate group. Insects (such as butterflies, fleas, and beetles), myriapods (such as centipedes and millipedes), crustaceans (such as crabs, pill woodlice, and lobsters), arachnids (such as spiders, scorpions, and ticks), and horseshoe crabs are all examples of arthropods.

[3] **Sponges** are the simplest of all animals. Inhabiting mostly oceans but occasionally freshwater, they are headless and nerveless. As their movement is very difficult to detect, and they always attach to rocks, sponges were once thought to be aquatic plants! Sponges feed through a filter system. Thousands of pores covering the outside of a sponge pump water into the sponge's body. Collar cells lining the inside of the sponge sort out planktons or other microorganisms from the water. Once food particles are trapped and digested by collar cells, sponges expel the water through an opening at the top of the sponge.

[4] **Cnidarians** are also simple aquatic animals like sponges, but their possession of a nerve system makes them more complex than sponges. Jellyfish, hydras, sea anemones, and corals make up the four classes of cnidarians. All cnidarians have tentacles around their mouths. Each tentacle is covered with sting cells, and each sting cell has a highly sensitive trigger. When a fish touches a trigger, a harpoon-like thread fires out and injects toxin into the doomed victim. So, now you know why you feel so uncomfortable when a jellyfish stings you!

[5] **Segmented worms** are also known as annelid worms. They can be divided into three classes: bristle worms, earthworms, and leeches. As the name suggests, segmented worms have several segments in their bodies, and many of these segments are identical. When we say "identical", we mean that each segment contains a complete set of organs and acts as a separate working unit. Segmented worms' guts run through their bodies and work the miracle of holding all their body segments together.

[6] **Flatworms** are the simplest of all worms. Tapeworms are perhaps the most well known flatworms. As parasites, tapeworms hide inside animals' intestines and can make their hosts very sick!

[7] **Roundworms** or **nematodes** are usually so tiny that you cannot see them with your bare eyes. Like flatworms, many roundworms are parasites. Famous roundworms include hookworms and threadworms. Although both roundworms and segmented worms have cylindrical shapes, roundworms do not have segments in their bodies.

[8] **Mollusks** include animals such as snails, slugs, clams, octopuses, squids, and cuttlefish. Some mollusks (like clams) have shells to protect their soft bodies, but others (like slugs) do not. Some mollusks (like snails) crawl on their broad and muscular foot, but others (like octopuses) prefer to swim. While one mollusk species may neither look nor behave like another mollusk species, it does possess at least one of the three common features found in all mollusks. To qualify as a mollusk, an animal must have a ribbon-like tongue with thousands of tiny, sharp teeth, or a protective case, or a layer of mantle to house its gills.

[9] **Echinoderms** can only be found in oceans. Starfish, sea urchins, brittle stars, and sea cucumbers are common examples of echinoderms (pronounced "ee-KI-noh-derms"). Many echinoderms have spikes to guard them against predators. What makes echinoderms so special is that they have a complicated hydraulic system inside their bodies. We call such a system echinoderms' water vascular system. As echinoderms pump water into their hydraulic system, they are able to move, eat, sense their surroundings, and breathe.

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1. What are invertebrates?
   - (A) Invertebrates are animals that have backbones.
   - (B) Invertebrates are animals that do not have backbones.
   - (C) Invertebrates are animals that cannot produce milk to feed their young.
   - (D) Invertebrates are animals that breathe through gills.

2. Arthropods are the most abundant animal species on Earth.
   - (A) True
   - (B) False

3. Which of the following about annelid worms is true?
   - (A) Annelid worms are also known as roundworms.
   - (B) Annelid worms are also known as nematodes.
   - (C) Hookworms are annelid worms.
   - (D) Leeches are annelid worms.

4. Which of the following about mollusks is true?
   - (A) All mollusks have hard shells to protect them from predators.
   - (B) Snails and crabs are two examples of mollusks.
   - (C) Not all mollusks crawl.
   - (D) Mollusks have a unique water vascular system that helps them to breathe, move, eat, and feel their surroundings.

5. Which of the following is **not** an invertebrate?
   - (A) Penguin
   - (B) Spider
   - (C) Sea urchin
   - (D) Clam

6. All of the animals below are arthropods except _____.
   - (A) A tapeworm
   - (B) A butterfly
   - (C) A lobster
   - (D) A scorpion

7. What are the common features of arthropods? (Please choose two of the best answers.)
   - (A) They all fly.
   - (B) They all have exoskeletons.
   - (C) They all have jointed legs.
   - (D) They all have an internal hydraulic system to help them move and breathe.

8. What is the simplest of all animals on Earth?
   - (A) Cnidarian
   - (B) Sponge
   - (C) Echinoderm
   - (D) Flatworm

9. Which of the following invertebrates have sting cells in their tentacles?
   - (A) Sponges
   - (B) Jellyfish
   - (C) Insects
   - (D) Starfish

10. Which of the following worms is **not** a parasite?
    - (A) Hookworm
    - (B) Earthworm
    - (C) Tapeworm
    - (D) Threadworm